

### **REMARKS/ARGUMENTS**

Applicants and Applicants' attorney express appreciation to the Examiner for the courtesies extended during the recent interview held on March 17, 2004. Reconsideration and allowance of the above-identified application are respectfully requested. Claims 1-20, 22-28 and 30-35 are pending in the application, wherein claims 1-15, 17-20 and 22-28 have been amended, claims 21 and 29 have been cancelled, and new claims 30-35 have been added. Claims 17-20 and 22-28 are withdrawn from consideration as being directed to non-elected claims. The Office Action has allowed claims 8-16 and indicates that claim 4 defines allowable subject matter.

The Office Action rejects claims 1-2 and 6-7 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,110,258 to Lauder and claims 3 and 5 under 35 U.S.C. § 103(a) as being unpatentable over Lauder. In response, Applicants point out that Lauder discloses a catalyst that is specifically designed to catalytically reduce NO<sub>x</sub> to nitrogen gas (N<sub>2</sub>). Col. 3, line 66 – col. 4, line 2; col. 8, lines 42-47. In contrast, independent claims 1 and 7 of the present application claim a catalyst that is designed to catalytically oxidize NO<sub>x</sub> (e.g., NO) to NO<sub>2</sub> or higher oxides of nitrogen, which facilitates their removal from a combustion gas stream by scrubbing. Application, page 4, lines 25-29. Oxidation is the exact opposition of reduction. Thus, notwithstanding any superficial similarity that may appear to exist between the NO<sub>x</sub>-reducing catalyst of Lauder and the NO<sub>x</sub>-oxidizing catalysts disclosed in the present application, the NO<sub>x</sub>-oxidizing catalysts of claims 1 and 7 possess properties and/or have molecular structures that cause them to be fundamentally different from the Lauder catalyst.

In order to emphasize this difference, claims 1 and 7 have been amended to specifically recite that the absorption sites and oxidation sites for NO<sub>x</sub> are "adjacent to each other and arranged so as to promote adsorption and oxidation of nitrogen oxides when exposed to fuel combustion gases containing nitrogen oxides". Support for this limitation is derived from the claims as originally filed in light of the examples in which preferred catalysts according to the invention were tested and found to oxidize NO<sub>x</sub> to NO<sub>2</sub>. Application, pages 15-16. Because the Lauder catalyst promotes the reduction of NO<sub>x</sub> to nitrogen gas, rather than oxidation of NO<sub>x</sub>, when NO<sub>x</sub> is exposed to the Lauder catalyst, it logically follows that the catalytic sites in the Lauder catalyst lack the specific arrangement of adsorption and oxidation sites recited in claims 1 and 7.

Without being held to any specific theory, it is probable that the Lauder catalyst has a different crystalline structure at the molecular level by virtue of how it is formed. The Lauder catalyst is formed by grinding metal oxide or metal oxide precursor compounds together and heating them at high temperature, typically followed by additional grinding and heating, in order to form the finished catalyst. Col. 6, lines 10-31. In contrast, exemplary methods for making catalysts according to the invention involve the formation of an intermediate aqueous composition that contains absorption function metal ions, oxidation function metal ions, and a multi-functional binding acid agent that causes the resulting metal oxides to be intimately bonded together in a crystalline structure upon heating and drying the aqueous composition. Application, page 6, line 18 – page 7, line 9. Moreover, due to the fact that both Lauder and the present application provide numerous examples of various metals that may alternatively be used to form the respective catalysts, the identities and ratios of metals employed in the exemplary catalysts disclosed in the present application are quite different from the identities and ratios of metals employed in the exemplary catalysts disclosed in Lauder. In any event, because the catalysts defined in claims 1 and 7 are NO<sub>x</sub>-oxidation catalysts, while the Lauder catalyst is a NO<sub>x</sub>-reduction catalyst, claims 1 and 7 are novel and unobvious over Lauder. Accordingly, Applicants respectfully request reconsideration and withdrawal of the claim rejections.

As discussed during the Examiner Interview, product-by-process claims would distinguish over Lauder. Moreover, because of the difficulty in precisely defining the chemical and/or structural differences between the NO<sub>x</sub>-oxidation catalysts disclosed in the present application and the NO<sub>x</sub>-reduction catalyst of Lauder, the Examiner indicated that product-by-process claims should be broadly interpreted so as to not require an infringing catalyst to actually be made using the recited process steps. Accordingly, Applicants have added new claims 30 and 31 in order to claim bi-functional catalysts that are obtainable by the methods recited in claims 8 and 12, respectively. Applicants have also added new independent claim 32 in order to recite that manufacture of the bi-functional catalyst involves the formation and drying of an intermediate aqueous composition. Lauder discloses no such method of making a catalyst, and the catalyst made according to Lauder has different properties as discussed above. Accordingly, Applicants submit that claims 30-32 define patentable subject matter.

New independent claims 33 and 34 alternatively claim specific compositions that are not disclosed in Lauder. Lauder discloses "[b]arium compounds having the general formula ABO<sub>3</sub>".

Abstract. "In these compounds, barium is substantially the only metal in the A cation sites". Col. 2, lines 63-64 (emphasis added). Although neither claim 33 nor claim 34 excludes barium, it is clear that barium is not "substantially the only metal in the A cation sites" (to the extent the claimed catalysts happen to have A cation sites at all). Accordingly, Applicants submit that claims 33 and 34 define patentable subject matter.

Finally, new independent claim 35 recites a catalyst in which "the molar ratio of metal in the adsorption function metal oxide component to metal in the oxidation function metal oxide component [is] in a range of 1:3 to 1:6". Support for this limitation is found at page 10, lines 14-15. As pointed in the Office Action, "Lauder discloses a 1:1 molar ratio of barium to platinum/nonplatinum metals", which is outside the range recited in claim 35. Accordingly, Applicants submit that claim 35 defines patentable subject matter.

Applicants wish to clarify their election in response to the restriction requirement. Applicants elected claims 1-16 of Group I without traverse but requested rejoinder of non-elected process claims 17-29 of Group II upon the allowance of claim 1, since claims 17-29 recite the use of the composition of claim 1. It is well-established that a process claim that recites the use of a patentable composition is itself patentable and suitable for rejoinder upon the allowance of a composition claim that is commensurate in scope. *See In re Brauwer; In re Ochiai*. Accordingly, Applicants renew their request for claims 17-20 and 22-28 to be rejoined upon the allowance of claim 1 since claim 17 recites the use of the catalyst of claim 1.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, or which can be overcome by examiner amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 22<sup>nd</sup> day of March 2004.

Respectfully submitted,



JOHN M. GYNN  
Registration No. 36,153  
Attorney for Applicant  
Customer No. 022913